

## Forensic Science Program Mission Statement and Program Goals

**[NOTE: Revisions in Process, to be posted in Spring 2008]**

The undergraduate major in Forensic Science is designed to provide students from varied backgrounds and academic interests with a curriculum in the general forensic sciences. This curriculum will serve as a preparation for a baccalaureate-level career in criminalistics and law enforcement or as preparation for post-graduate education in the forensic sciences.

After meeting the requirements of the Forensic Science Program students will be able to

<b>Goals</b>
1. demonstrate familiarity with a broad range of forensic science fields, techniques, and concepts
2. demonstrate scientific thought and techniques, and perform scientific analysis pertinent to the forensic sciences
3. participate in activities which will further his or her development as a scientist and forensic scientist

### Assessment Plan

#### **Goal 1: demonstrate familiarity with a broad range of forensic science fields, techniques, and concepts**

##### Educational Experiences

Each forensic science student must complete both lecture based and laboratory based forensic science survey courses, ANTH 345 Forensic Science and ANTH 346 Analysis of Forensic Evidence, respectively. ANTH 345 is offered as a pre- and co-requisite to ANTH 346, but most students take ANTH 345 as a pre-requisite. A variety of forensic fields are covered in each class. ANTH 346 focuses on the application of forensic techniques, such as latent fingerprint recovery or crime scene processing.

#### **ANTH 345 Syllabus Excerpt**

#### **ANTH 346 Syllabus Excerpt**

Topic	Topic
Introduction, Fields of Forensic Science;	Introduction/Course Design /Ethics
Crime Scene; Physical Evidence	Logic and Precision/ Density/Characteristics
Physical Evidence	Microscopy
Physical Properties Glass & Soil	Serology/DNA
Organic Analysis	PPE/Bloodborne Pathogens Training/Pathology
End Organic Analysis; Inorganic	Anthropology, Odontology
Microscope; Hairs, Fibers, & Paint	Bloodspatter Patterns
Drugs;Forensic Toxicology	Indoor Crime Scene
Serology; DNA;	Fingerprinting
Arson and Explosion;	Latent Print II (ALS)

Fingerprinting	Gun Video/ Ballistics
Firearms	Trace: Hair/Fiber/Impressions
Questioned Documents	Finish Trace? Questioned Documents
Topic	Trace: Controlled Substances/ Toxicology;
Introduction, Fields of Forensic Science;	Outdoor Crime Scene
Crime Scene; Physical Evidence	Notebook Inspection

#### Assessment Methods

The program director collects all assessment data for this goal.

Part I: Successful completion of both survey courses with a grade of “C” or better (forensic science majors must maintain a GPA of 2.2 or greater) is accepted as a demonstration of familiarity with a range of forensic science fields.

Part II: Topical pop quizzes in ANTH 346 are used to test the student’s awareness of content from ANTH 345. The quiz results are used immediately to inform lecture contents and homework assignments during the term. A class average below 70% on a pop quiz results in modification of lecture or homework content.

Students compile a notebook in ANTH 346 composed of the work completed throughout the semester. The notebook is graded based on organization and complete representation of course products. The following rubric is employed in grading the notebooks:

50	Contents complete; notebook clearly organized
45	Minor disorganization or one critical item missing (e.g., syllabus, exam)
40	Combination of minor disorganization and absence of one critical item
35	Absence of multiple items or disorganization
30	Unbound/unassembled collection

At the end of each Spring term the component of the ANTH 346 scores related to the notebook are averaged for that course. A class average greater than 35 is accepted as indication that students are acquiring satisfactory familiarity with a range of forensic fields.

#### **Goal 2: demonstrate scientific thought and techniques, and perform scientific analysis pertinent to the forensic sciences**

##### Educational Experiences

The forensic science curriculum is designed to provide the scientific foundation for a career in both the most popular forensic sciences, and the fields directly adjacent to these popular sciences. The 2007 curriculum shown below contains foundation courses in biology and chemistry, as well as upper division courses appropriate to a science and forensic science career. The program director oversees the content and assessment of courses beginning with the ANTH prefix.

## B.S. WITH A MAJOR IN FORENSIC SCIENCE

Required: 125 credits (36 of which must be numbered 300 or above, and 60 of which must be from a 4-year institution) including:

### I. General Education Requirements (see University GER listing).

### II. Evidence Technician Track: the following curriculum:

68 Major Credits including:

#### Required Courses (59 credits):

ANTH 345	Forensic Science	(3)
ANTH 346	Analysis of Forensic Evidence	(3)
COMM 110	Fundamentals of Public Speaking	(3)
CJ 201	Introduction to Criminal Justice	(3)
CJ 210	Introduction to Policing	(3)
CJ 352	Criminal Investigation	(3)
CJ 353	Law for Criminal Justice System	(3)
BIOL 150/150L	General Biology I & Lab	(4)
BIOL 151/151L	General Biology II & Lab	(4)
CHEM 121/122	General Chemistry I & II	(6)
CHEM 121L/122L	General Chemistry Lab I & II	(2)
CHEM 240	Survey of Organic Chemistry	(4)
CHEM 333	Introductory Environmental, Clinical, and Forensic Chemical Analysis	(4)
PHYS 161/161L	Introductory College Physics I	(4)
PHYS 162/162L	Introductory College Physics II	(4)

3 credits from:

BIOL 470	Biometry	(3)
SOC 326	Sociological Statistics	(3)

3 credits from:

PHIL 215	Contemporary Moral Issues	(3)
PHIL 370	Ethics in Engineering and Science	(3)
PHIL 372	Ethics in Health Care	(3)

#### ELECTIVES (9 credits):

ANAT 204	Anatomy for Paramed Personnel	(3)
ANTH 270	Introduction to Forensic Anthropology	(3)
ANTH 439	Human Osteology	(4)
ANTH 441	Forensic Anthropology Field School	(1-6)
ANTH 497	Forensic Science Internship	(1-6)
BIOL 315	Genetics	(3)
BIOL 336	Systematic Botany	(4)
BIOL 363	Entomology	(4)
PSYC 270	Abnormal Psychology	(3)

### III. Evidence Analyst Track: the following curriculum:

93 Major Credits including:

**Required Courses (84 credits):**

<b>ANTH 345</b>	<b>Forensic Science</b>	<b>(3)</b>
<b>ANTH 346</b>	<b>Analysis of Forensic Evidence</b>	<b>(3)</b>
<b>COMM 110</b>	<b>Fundamentals of Public Speaking</b>	<b>(3)</b>
<b>CJ 201</b>	<b>Introduction to Criminal Justice</b>	<b>(3)</b>
<b>CJ 210</b>	<b>Introduction to Policing</b>	<b>(3)</b>
<b>CJ 352</b>	<b>Criminal Investigation</b>	<b>(3)</b>
<b>CJ 353</b>	<b>Law for Criminal Justice System</b>	<b>(3)</b>
<b>BIOL 150/150L</b>	<b>General Biology I &amp; Lab</b>	<b>(4)</b>
<b>BIOL 151/151L</b>	<b>General Biology II &amp; Lab</b>	<b>(4)</b>
<b>BIOL 315</b>	<b>Genetics</b>	<b>(3)</b>
<b>BIOL 333</b>	<b>Population Biology</b>	<b>(3)</b>
<b>BIOL 470</b>	<b>Biometry</b>	<b>(3)</b>
<b>BMB 301</b>	<b>Biochemistry and Molecular Biology</b>	<b>(3)</b>
<b>BMB 403</b>	<b>Advanced Biochemistry Laboratory</b>	<b>(2)</b>
<b>CHEM 121/121L</b>	<b>General Chemistry I &amp; Lab</b>	<b>(4)</b>
<b>CHEM 122/122L</b>	<b>General Chemistry II &amp; Lab</b>	<b>(4)</b>
<b>CHEM 333</b>	<b>Introductory Environmental, Clinical, and Forensic Chemical Analysis</b>	<b>(4)</b>
<b>CHEM 341/341L</b>	<b>Organic Chemistry &amp; Lab</b>	<b>(5)</b>
<b>CHEM 342/342L</b>	<b>Organic Chemistry II &amp; Lab</b>	<b>(5)</b>
<b>MATH 165</b>	<b>Calculus I</b>	<b>(4)</b>
<b>MATH 166</b>	<b>Calculus II</b>	<b>(4)</b>

**3 credits from:**

<b>PHIL 215</b>	<b>Contemporary Moral Issues</b>	<b>(3)</b>
<b>PHIL 370</b>	<b>Ethics in Engineering and Science</b>	<b>(3)</b>
<b>PHIL 372</b>	<b>Ethics in Health Care</b>	<b>(3)</b>

**8 credits from:**

<b>PHYS 161/161L</b>	<b>Introductory College Physics I &amp; Lab</b>	<b>(4)</b>
<b>PHYS 162/162L</b>	<b>Introductory College Physics II &amp; Lab</b>	<b>(4)</b>
<b>OR</b>		
<b>PHYS 211/211L</b>	<b>College Physics I &amp; Lab</b>	<b>(4)</b>
<b>PHYS 212/212L</b>	<b>College Physics II &amp; Lab</b>	<b>(4)</b>

**ELECTIVES (9 credits):**

<b>ANAT 204</b>	<b>Anatomy for Paramed Personnel</b>	<b>(3)</b>
<b>ANTH 270</b>	<b>Introduction to Forensic Anthropology</b>	<b>(3)</b>
<b>ANTH 439</b>	<b>Human Osteology</b>	<b>(4)</b>
<b>ANTH 441</b>	<b>Forensic Anthropology Field School</b>	<b>(1-6)</b>
<b>ANTH 497</b>	<b>Forensic Science Internship</b>	<b>(1-6)</b>
<b>BIOL 336</b>	<b>Systematic Botany</b>	<b>(4)</b>
<b>BIOL 363</b>	<b>Entomology</b>	<b>(4)</b>
<b>PSYC 270</b>	<b>Abnormal Psychology</b>	<b>(3)</b>
<b>CLS 301</b>	<b>Immunology</b>	

ANTH 346 Analysis of Forensic Evidence is assessed in particular because one of the goals of the course is for students to develop protocols and perform tests pertinent to forensic analysis. The course content of ANTH 346 centers on laboratory exercises which require students to develop strategies for completion of assigned tasks. For example, the Indoor Crime Scene and Outdoor Crime Scene exercises require that the students develop a plan, beginning with assigning roles to team members, for documenting the staged crime scene, proposing a scenario that created the scene, and recognizing and recovering evidence from that scene. Other exercises involve practice of forensic laboratory skills, such as latent print recovery with chemical developers, or experimenting with different techniques for fiber evidence analysis. The students record these exercises in a written report that documents the objective of the exercise, the protocol used to reach the objective, the results of the protocol, and a discussion of those results. The best reports will include additional content at the student's initiative, such as an appropriate illustration.

A few (2-4) students each year obtain internships in crime laboratories, for which they enroll in ANTH 497 Forensic Science Internship. The internships are full time positions during which students participate in the activities of the crime laboratory or conduct a special project for the lab. The internship is frequently the first opportunity for the students to demonstrate scientific thought and techniques pertinent to the forensic sciences.

#### Assessment Methods

The program director collects all assessment data that is related to the courses with the ANTH prefix. Assessment of non-ANTH courses is left to the auspices of that course's department.

Part I: Successful completion of ANTH 346 (obtaining a grade of "C" or better) is accepted as indication that the students have met Goal 2.

Part II: Class average of 14 or better for laboratory report scores. Each lab report is worth 20 points. The following rubric is used when grading the laboratory reports:

20	Excellent work	a perfect report, correct in format, spelling, and content, having additional content and/or displaying well developed responses
19-18	Nearly excellent work	slight errors in an otherwise perfect report, no omissions, and appropriate additional content
18-16	Good work	no major omissions in the materials section, no missing attachments, all exercise components addressed and thought out, format correct, spelling or grammar errors minimal or absent
15-14	Average work	omitted materials, formatting mostly correct but some errors, perhaps one attachment missing, some (but not all) question responses poorly developed
13 -12	Barely Passing	a combination of the following: failure to follow instructions in lab procedure, report formatting, and/or omission of half of lab assignment (such as

		omitting an exercise or in-class instructions), attachments not included, question responses poorly thought out, careless spelling and/or grammar
11 and lower	Failing Work	failed to turn in lab report, committed plagiarism, or showed history (no previous labs in correct form) of disregard of laboratory report format instructions

At the end of each Spring term the component of the ANTH 346 scores related to the written reports are averaged for each report and for the entire semester. Improvement (averages increasing towards 20) over the course of the semester is accepted as indication that students are grasping the analysis and report writing process. A semester average of 14 or better for all reports indicates that students are grasping the skills to perform an analysis and process and write a scientific report pertinent to a forensic exercise. If low averages are consistently obtained after the third report, instruction is modified immediately in order to provide more feedback, clarify instructions, or provide other support necessary to improve learning.

Part III: At the end of the internship both intern and host agency are evaluated. Samples of the evaluations completed by the intern and the agency are included below. Responses to questions 5-11 of the Internship Evaluation and questions 7 and 8 of the Agency Evaluation are considered in determining student's intellectual preparedness for the internship. Although these data are from a small sample, they are valued as illustrative of forensic student's ability to apply scientific thought and techniques. The results of this assessment are employed primarily for student advising, but also for curriculum development. The data collected in this assessment is also summarized in narrative form in the annual report.

## Internship Evaluation

Please complete this survey at the end of your internship experience. Your responses are confidential and will not be shared with the facility in which you interned.

1. At what agency did you complete your internship?
2. How long was your internship in weeks?
3. For how many credits did you complete the internship?
4. Was the time spent worth the number of credits received?
- 4a. If not, how many credits would have been appropriate?
5. How satisfied are you with your internship experience?
  - 1 dissatisfied
  - 2 unsatisfied
  - 3 neutral
  - 4 satisfied
  - 5 very satisfied
6. How well did your academic training prepare you for your tasks in the internship? Please give examples.
7. In what ways were you unprepared for the internship?
8. How satisfied are you with the UND Forensic Science Program's role in preparing you for your internship?
  - 1 dissatisfied
  - 2 unsatisfied
  - 3 neutral
  - 4 satisfied
  - 5 very satisfied
9. What would you change about the Forensic Science Program's role in preparing your for your internship?
10. Had you taken ANTH 346 Analysis of Forensic Evidence and/or Chem 333 Introduction to Clinical Environmental and Forensic Chemical Analysis before this internship?
11. If yes, were the laboratory procedures of ANTH 345 and/or CHEM 333 valuable for you in this internship? Please explain your reply.

12. How did your internship experience affect your interest in a career in the forensic sciences?
13. Would you recommend this agency and its internship program to other students, and if so why?
  - 13a. Why would you not recommend it?
14. What advice would you give to a fellow student applying for internships at this or other agencies?
15. If you have any other comments about your experience please write them here.

---

FORENSIC SCIENCE PROGRAM  
P.O. BOX 8374  
GRAND FORKS, NORTH DAKOTA 58202-8374  
PHONE (701) 777-4870  
FAX (701) 777-4006

Dear Supervisor,

Thank you for taking the time to complete this survey. Your responses will be held confidential and only used to better prepare our students for internship experiences in your agency and others like it. If you have any comments or questions about our forensic science program which cannot be addressed by this survey, please do not hesitate to contact me through the resources above. Thank you again for your time.

Sincerely,

Phoebe R. Stubblefield, Ph.D.  
Director

Please complete this survey regarding your experiences with your recent intern from the University of North Dakota Forensic Science Program. Your responses are confidential and will not be shared with the intern or used for reasons outside of program improvement.

1. What is the name and address of your agency?

2. Who was your intern?

3. When was the intern with your agency?

4. How satisfied were you overall with this intern?

- 6 dissatisfied
- 7 unsatisfied
- 8 neutral
- 9 satisfied
- 10 very satisfied

5. Was this intern chosen to work on specific projects in your facility? If yes, what type of role did you plan the intern to take in the project?

- 1 project designer
- 2 assistant to project designer
- 3 technician in pre-designed project
- 4 presenter of project results
- 5 other (please describe below)

6. Did the intern have duties which required him or her to work in different sections of your facility over the course of the internship? If yes, please list the sections in which the intern was active.

7. How satisfied were you with the intern's academic preparedness for his or her intern duties?

- 6 dissatisfied
- 7 unsatisfied
- 8 neutral
- 9 satisfied
- 10 very satisfied

8. In which areas in particular would you like to see better preparedness in future interns from this program?

9. Please describe any concerns or comments about the following components of the academic administration of your intern during the internship.

a. your awareness of the intern's requirement to receive credit

b. the frequency of reports to the academic advisor

c. the content of reports to the academic advisor

d. your level of communication with the academic advisor about the intern

10. If you have any other comments about your experience please include them here.

### **Goal 3: participate in extracurricular activities which will further his or her development as a scientist and forensic scientist**

#### Educational Experiences

The program director organizes, schedules, and advertises several activities that support career development. These activities fall into three types, Outreach Activities, Professional Development, and Guest Lecturer Education. Outreach Activities compose the majority of career development opportunities. These take the form of 1) short lectures and demonstrations on forensic science topics at regional middle and high schools, or 2) presentations and exhibits in half-day public education events local to Grand Forks such as MarketPlace for Kids, Super Science Saturday (hosted by the Dakota Science Center) and First Night. Professional Development currently takes the form of persuading and encouraging students to attend the annual meeting of the American Academy of Forensic Sciences. If students are willing to attend, the program director, as advisor to the Forensic Science Club, works with club members to raise funds and to prepare intellectually for the conference. Guest Lecture Education is a new component of career development that involves the Forensic Science Club hosting forensic practitioners as guest speakers to the club and/or the general public.

#### Assessment

The program director collects all assessment data for this goal.

**Outreach Assessment:** After each outreach event the director uses an informal meeting with participants to collect anecdotal responses on the event. The director asks a combination of open-ended and yes-no questions in order to open a discussion about the quality of the experience for the student. Sample questions include:

- Was this event what you expected?
- What did you think of the event overall?
- Did you feel prepared for (your role in) the demonstrations?

Outreach events are considered successful if the following circumstances are met:

1. Students willingly volunteer to participate
2. Students provide positive feedback (“I liked it; I would do it again; Next time we should...”)
3. Students encourage each other to participate in the outreach

This third criterion is the best marker of a successful outreach activity, since students can hear from peers that the activity is a worthwhile investment.

**Professional Development Assessment:** In the first club meeting after the conference, when the attendees are describing the experience to fellow club members who did not attend, the program director collects anecdotal data by taking notes of the discussion. The respondents are not identified and the director attempts to interject few questions or comments so that the conversation can remain peer oriented. The success of this event is determined by meeting the same criteria as the outreach events, except that the feedback in item 2 is more focused (“networking capabilities; usefulness of the Career Faire; content of the presentations and

posters”). Again, the best marker of success has been the third criterion, as the students who attended in previous years become enthusiastic advertisers for the next year’s conference.

**Guest Lecturer Education Assessment:** This is a new program initiated by the Forensic Science Club at the end of the Spring Term in 2007; the speaker schedule is in development for Fall 2007 and Spring 2008. The anticipated assessment plan for these events is to collect a combination of informal anecdotal data from club members and to administer audience questionnaires after each guest speaker. The questionnaire is in development and will be featured in the 2008 update of the assessment plan.

All of the assessment data collected for Goal 3 is summarized in narrative form in the annual report. Events which received substantial negative feedback are modified or cancelled at the discretion of the program director or after discussion in the Fall planning meetings of the Forensic Science Club.